REMARKS/ARGUMENTS

The foregoing amendment and the following arguments are provided to impart precision to the claims, by more particularly pointing out the invention, rather than to avoid prior art. Applicants thank the Examiner for initialing and returning a copy of the PTO-SB08A listing art previously submitted by the Applicants.

SPECIFICATION

The Office Action objected to the specification because paragraph 32 on page 17 refers to "the source/drain extensions 529," which are previously identified ad item 526.

Applicants amended the paragraph to read "the source/drain extensions 526" to correct the typographical error.

35 U.S.C. § 103 (e) Rejections

Examiner rejected claims 12-23 and 25 under 35 U.S.C. § 103(a) as being unpatentable by U.S. Patent No. 6,180,468 to Yu ("Yu") in view of U.S. Published Application No. US 2005/0167673 to Maegawa (hereinafter "Maegawa").

Claim 24 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over Yu in view of Maegawa as applied to claim 21 above, and further in view of U.S. Published Application to Weber ("Weber").

Applicants respectfully disagree with the rejection and request reconsideration of the application.

Claims 12 and 16

Claims 12 and 16 require an indium-fluorine retrograde well inside a substrate with an indium concentration greater than about 3E18/cm3.

Yu describes a very low thermal budget for the retrograded channel doping implant because the channel implant is performed after the source/drain implant, the source/drain extension implants, and the corresponding thermal annealing processes. (Yu, col. 2, ll. 32-36). Furthermore, Yu describes the use of **channel dopants such as indium, antimony, phosphorous, and arsenic**. Yu fails to disclose an indium-fluorine retrograde well with a substrate with an indium concentration greater than about 3E18/cm3.

Maegawa describes a thin-film transistor (TFT) to prevent the compensation of boron in a P-type drain resulting from diffusion of phosphorus from an N-type pad layer. (Maegawa, para. [0179]). Specifically, Maegawa describes **implanting nitrogen into a polysilicon pad layer** to suppress diffusion of phosphorus contained in the pad layer and preventing infiltration of phosphous into the drain. (Maegawa, paras. [0184] and [0216]). Maegawa further describes the replacement of nitrogen with fluorine or chlorine **for suppressing diffusion of phosphorus in the pad layer and boron in the drain**. (Maegawa, paras. [0214] and [0218]). Maegawa fails to describe an indium-fluorine retrograde well inside a substrate with an indium concentration greater than about 3E18/cm3. Moreover, Maegawa and Yu fail to describe or suggest the use of fluorine in conjunction with indium as a channel implant in a silicon substrate.

Because Yu and Maegawa fail to describe or suggest the use of an indium-fluorine retrograde well inside a substrate, the combination of Yu and Maegawa fails to describe or suggest the use of an indium-fluorine well inside a substrate.

Moreover there is no motivation for one skilled in the art of combating short-channel effects to combine Yu with Maegawa because they solve different problems. Yu describes solving short-channel effects through the use of an ultra-low thermal budget process for channel dopants in sub-100 nm MOS transistors. (Yu, col. 1, ll. 49-54). On the other hand, Maegawa describes preventing N-type conversion of a polysilicon drain of a thin-film transistor caused by diffusion of phosphorus from an N-type pad layer of a thin-film transistor to prevent a PNP transistor converting to a PNN diode during a heat treatment performed later in the fabrication. (Maegawa, paras. [0025], [0187], [0190], and [0209]). Maegawa does not describe combating short-channel effects through the use of channel implants. Furthermore, neither Yu nor Maegawa describe or suggest that a solution for preventing N-type conversion of a polysilicon drain in a TFT would apply to preventing short-channel effects in a MOS device.

Claim 21

Claim 21 requires a fluorine-indium retrograde well directly beneath the gate structure and between the source/drain regions, the fluorine-indium retrograde well including an indium concentration greater than 3E18/cm3.

Yu, as discussed above, fails to disclose a fluorine-indium retrograde well directly beneath the gate structure and between the source/drain regions, the fluorine-indium retrograde well including an indium concentration greater than 3E18/cm3.

Similarly, Maegawa, as discussed above, fails to disclose a fluorine-indium retrograde well directly beneath the gate structure and between the source/drain regions, the fluorine-indium retrograde well including an indium concentration greater than 3E18/cm3. Moreover, Maegawa and Yu fail to describe or suggest the use of fluorine in conjunction with indium as a channel implant in a silicon substrate.

Because Yu and Maegawa fail to describe or suggest the use of an indium-fluorine retrograde well inside a substrate, the combination of Yu and Maegawa fails to describe or suggest the use of an indium-fluorine well inside a substrate.

Moreover there is no motivation for one skilled in the art of combating short-channel effects to combine Yu with Maegawa because they solve different problems (see above).

Claims 13-15, 17-20, and 22-25

The remaining claims depend from one of the independent claims discussed above and therefore also include the distinguishing claim limitations. As a result, the remaining claims are also not anticipated and are allowable for at least the reasons stated above.

CONCLUSION

Applicants respectfully submit the present application is in condition for allowance. If the Examiner believes a telephone conference would expedite or assist in the allowance of the present application, the Examiner is invited to call the undersigned at (408) 720-8300.

Authorization is hereby given to charge our Deposit Account No. 02-2666 for any charges that may be due.

Respectfully submitted,

BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP

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Michael A. Bernadicou
Reg. No. 35,934

12400 Wilshire Boulevard
Seventh Floor
Los Angeles, CA 90025-1026
(408) 720-8300